

The Bornean Species of *Eugenia*, *Schefflera*, and *Saurauia*, represented in the Singapore Herbarium.

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Through the kindness of Mr. I. H. Burkill, Director of the Botanic Garden, Singapore, I was recently loaned the Bornean material of the genera *Eugenia*, *Schefflera*, and *Saurauia* in the herbarium of that institution for study. My original request for this material was prompted chiefly by the idea that through a study of it I would be able specifically to determine a number of specimens of these three genera in the herbarium of the Bureau of Science which were inadequate or incomplete. On receiving the material, however, I found that although most of it comes from Sarawak, from the same general regions whence I have received most of my own Bornean material, comparatively few of the specimens match unidentified material in the herbarium of the Bureau of Science, and a number of sheets represent species entirely different from any of the named species in the latter herbarium. This fact impresses me with the belief that as yet the extant Bornean botanical material represents a relatively small part of the species that actually occur in Borneo, and that intensive field work in botany will add several thousand species to the list of those already recorded from this relatively little known Island. The results of my study of the Singapore material of the three genera under discussion are given below.

Eugenia, Linnaeus.

An examination of the Bornean material representing this genus in the Singapore herbarium has induced me to propose and describe six new species, and to enumerate the specimens representing other species so far as I have been able to identify them. In addition to the twenty-seven species listed below at least eleven others are represented, but in most cases the material is scarcely sufficient to determine whether or not they represent described forms, and if described to which species they appertain. There are now about eighty-five species of the genus credited to Borneo; but the list will certainly be greatly extended. There are, in addition to the eleven Bornean species in the Singapore herbarium

that I cannot specifically determine, twenty others represented in the herbarium of the Bureau of Science by collections which I have not as yet found expedient to determine except generically; more than one-half of the known Bornean species are represented by named specimens in the latter herbarium.

Eugenia kuchingensis, Merr. in J., S. B., R. A. S. **77** (1917) 213.

SARAWAK, *Hariland s.n.*, January, 1889, June, 1888; Rejang. *Hariland 2921*, August, 1893.

Eugenia javanica, Lam., Encycl. **3** (1789) 200.

SARAWAK, Matang, *Ridley 12264*, August, 1905.

Eugenia saligna, (Miq.) C. B. Rob. in Philip. Journ. Sci. **4** (1909) Bot. 392.

LABUAN, January, 1886, collector not indicated: Kuching, *Hariland 2931*, March 1, 1893, a form with relatively broad leaves.

Eugenia rufo-tomentosa, (Gibbs) Merr. in J., S. B., R. A. S. **77** (1917) 223.

SARAWAK, Kuching, *Hariland 1698*, September, 1892, 970, the latter with rather larger leaves and longer flowers. Both of these specimens have larger leaves and shorter hairs than has Mrs. Clemens's Kinabalu material.

Jambosa conferta, Korth. in Nederl. Kruidk. Arch. **1** (1848) 202.

SARAWAK, Kuching, *Hariland s.n.*, March 27, 1893. The identification has been made from the rather imperfect description alone. The species as I have interpreted it can scarcely be distinguished from *Eugenia reticulata*, Wight.

Eugenia zeylanica, (Linn.) Wight, Ic. **1** (1840) 73.

SARAWAK, *Hariland 67*; British North Borneo, Sandakan, *Ridley 9050*, December, 1897.

Eugenia lineata, (Blume) Duthie in Hook. f., Fl. Brit. Ind. **2** (1876) 487.

SARAWAK, *Hariland 67, s.n.*, May 20, 1893, 2927, and a specimen collected in August, 1884, collector not indicated.

Eugenia coralina, Merr. in J., S. B., R. A. S. **77** (1917) 207.

SARAWAK, near Kuching, *Hariland d, t, q, a*, November, 1892, two sheets, one in flower, the other in fruit.

Eugenia elliptilimba, Merr. in J., S. B., R. A. S. **77** (1917) 211.

SARAWAK, Kuching, *Haviland* 1987, December, 1892.

Eugenia densiflora, (Blume) DC., Prodr. **3** (1828) 287.

BORNEO, without definite locality but probably from Sarawak, *Ridley* 12388, on river banks.

Eugenia chlorantha, Duthie in Hook. f., Fl. Brit. Ind. **2** (1876) 487.

SARAWAK, Kuching, *Haviland* 2924, 2926, March, April, 1893, and three sheets without numbers.

Eugenia grandis, Wight, Ill. **2** (1841-50) 17.

SARAWAK, Rejang, *Haviland* 2920, June, 1893.

Eugenia ampullaria, Stapf in Trans. Linn. Soc. Bot. **4** (1894) 153, t. 11, f. c. 13.

BRITISH NORTH BORNEO, Mount Kinabalu, *Haviland* 1096, a cotype.

Eugenia besukiensis, (Hassk.) Merr. in J., S. B., R. A. S. **77** (1917) 226.

SARAWAK, near Kuching, *Haviland* 2091, January 11, 1893.

Eugenia operculata, Roxb., Fl. Ind. ed. 2, **2** (1832) 486.

SARAWAK, *Haviland*, 1893, the number illegible.

Eugenia myrtillus, Stapf in Trans. Linn. Soc. Bot. **4** (1894) 153.

BRITISH NORTH BORNEO, Mount Kinabalu, *Haviland* 1109, a cotype.

The form I credited to Mount Kinabalu as *Eugenia ugoensis*, C. B. Rob., in J., S. B., R. A. S. **77** (1917) 226, proves to be a fruiting specimen of Stapf's species. I can see no reason for distinguishing the two species and now believe that *E. ugoensis*, C. B. Rob. is identical with *E. myrtillus*, Stapf.

Eugenia baramensis, Merr. in J., S. B., R. A. S. **77** (1917) 218.

SARAWAK, Kuching, *Haviland* 1884, October, 1892.

Eugenia rugosa, (Korth.) Merr. in J., S. B., R. A. S. **77** (1917) 224.

SARAWAK, Braang, *Haviland* 104, December 27, 1888, on limestone.

Eugenia castanea, Merr. in J., S. B., R. A. S. **77** (1917) 212.

SARAWAK, Bergark, *Haviland* 122, January 8, 1889. The specimens differ from the type in having terete branchlets, while the bark is not at all flakey. These specimens much resembles Koorders's figure of *Eugenia ampliflora*, Koord. & Val.

Eugenia caudatilimba, Merr. in J., S. B., R. A. S. **77** (1917) 216.

SARAWAK, Kuching, *Haviland* 2925, April 13, 1893.

Eugenia alcinae, Merr. in Philip. Journ. Sci. **10** (1915) Bot. 216.

SARAWAK, Brooketon, *Haviland* 518, June 21, 1892;
BRUNEI, *Haviland* 67/38 without date.

Eugenia kingii, sp. nov. § *Jambosa*.

Species *E. plumbeae* affinis, differt foliis minoribus, nervis utrinque 5 vel 6.

A glabrous shrub, the branches terete, cinereous, the branchlets reddish-brown, rather slender, distinctly 4-angled, each internode thickened upward. Leaves opposite, chartaceous to subcoriaceous, lanceolate, 5 to 8 cm. long, 1.5 to 2.5 cm. wide, above brownish-olivaceous, smooth, shining, beneath paler, not punctate, narrowed upward to the rather slenderly acuminate apex and below to the obtuse to subacute base; lateral nerves 5 or 6 on each side of the midrib, prominent on the lower surface, somewhat ascending, anastomosing with the equally distinct marginal nerves about 2 mm. from the edge of the leaf, the reticulations distinct; petioles 2 to 3 mm. long. Cymes terminal, subsessile, 3- to 5-flowered, the rachis and very short branches 6 mm. long. or less. Flowers white, about 3 cm. in diameter, the calyx turbinate-infundibuliform, about 1.5 cm. long, narrowed below into a very short pseudostalk, the throat about 1.5 cm. in diameter; lobes reniform, coriaceous, 7 to 9 mm. wide. Styles slender, about 3.5 cm. long.

SARAWAK, Bongaya, *Ridley* 9071, December, 1897, "shrub, flowers white."

This specimen is mentioned by King¹ as being allied to *Eugenia plumbea*, King, from which it differs, however, in its smaller leaves, the lateral nerves being but one-half as many as in King's species.

Eugenia monantha, sp. nov. § *Jambosa*.

Arbor glabra, ramis teretibus, ramulis ultimis tenuibus, distincte 4-angulatis; foliis lanceolatis, epunctatis, chartaceis, usque ad 20 cm. longis, subolivaceis, nitidis, sursum gradatim

angustatis, longe et tenuiter subcaudato-acuminatis, interdum leviter falcatis, basi angustatis, acutis vel subobtusis; nervis lateralibus utrinque 12—17, subtus perspicuis, prominulis, anastomosantibus; *floribus* terminalibus, solitariis, circiter 5 cm. diametro, pedicellatis; calycibus late infundibuliformibus, tubo circiter 2 cm. longo.

A glabrous tree the branches slender, terete, the ultimate internodes distinctly 4-angled, slender, 2 mm. in diameter or less. Leaves lanceolate, sometimes slightly falcate, chartaceous, subolivaceous, 12 to 20 cm. long, 2 to 4.5 cm. wide, gradually narrowed upward to the long and slenderly acuminate apex, the acumen often distinctly caudate and up to 2.5 cm. in length, and below to an acute or somewhat obtuse base; primary lateral nerves 12 to 17 on each side of the midrib, prominent on the lower surface, somewhat curved, anastomosing with the equally distinct marginal nerves 3 to 4 mm. from the edge of the leaf, the latter slightly arched between the anastomoses, the reticulations rather close, distinct under a lens; petioles 4 to 8 mm. long. Flowers terminal, solitary, rather large, in anthesis about 5 cm. in diameter, their pedicels 1 to 2 cm. long, distinctly jointed to the calyx. Calyx broadly funnel-shaped, the throat about 1.5 cm. in diameter, the lobes suborbicular-reniform, subcoriaceous, about 8 mm. in diameter, the tube rather abruptly narrowed below forming a short pseudostalk. Style slender, about 3.5 cm. long.

SARAWAK, Rejang, *Hariland* 2146, November, 1892.

This species is strongly characterized by its lanceolate, slenderly acuminate leaves which distinctly resemble those of *Eugenia jambos*, Linn.; its slender terete branches and distinctly 4-angled ultimate internodes of the branchlets; and the large, solitary, terminal, pedicelled flowers. It apparently belongs in the group of *Eugenia jambos*, Linn., but is not closely allied to that species.

***Eugenia subracemosa*, sp. nov. § *Jambosa*.**

Arbor glabra, ramulis rugosis, distincte angulatis; *foliis* oppositis, coriaceis, in siccitate utrinque purpureo-brunneis, nitidis, coriaceis, oblongis vel oblongo-obovatis, utrinque subaequaliter angustatis, petiolatis, basi acutis vel acuminatis, apice acuminatis, usque ad 18 cm. longis, margine recurvatis, supra impresso-puncticulatis, nervis utrinque circiter 10, adscendentibus, perspicuis, juxta marginem anastomosantibus, reticulis obsoletis; *inflorescentiis* brevibus, subracemosis, paucifloris, fasciculatis, e tuberculis in ramis vetustioribus, usque ad 3 cm. longis; *floribus* brevissime pedicellatis; *calycis* tubo turbinato, circiter 3 mm. longo et 4 mm. diametro, deorsum angustato: *petalis* 4, liberis, circiter 4 mm. longis.

A glabrous tree, the branches and branchlets grayish to reddish-brown, rugose, the latter distinctly 4-angled, 3 to 3.5 mm. in diameter. Leaves opposite, coriaceous, when dry purplish-brown on both surfaces, shining, the upper surface smooth, minutely impressed-punctulate, the lower epunctate, oblong to oblong-obovate, 14 to 18 cm. long, 6 to 7 cm. wide, subequally narrowed to the acute or somewhat acuminate base and to the acuminate apex, the margins recurved; lateral nerves about 10 on each side of the midrib, distinct but only slightly projecting on the lower surface, ascending, anastomosing directly with the equally distinct marginal nerves 2 to 3 mm. from the edge of the leaf, the latter slightly arched between the anastomoses, the reticulations obsolete; petioles thickened, nearly black, rugose, up to 1 cm. in length. Inflorescences up to 3 cm. in length, subracemose, simple, fascicled, each usually 5-flowered, on the older branches, at least always below the leaves, each rachis usually with two lateral and three terminal flowers, the pedicels very short, not exceeding 2 mm. in length. Flowers, including the stamens, 10 to 12 mm. in diameter and about 8 mm. long. Calyx turbinate, the tube narrowed below, about 3 mm. long, the throat about 4 mm. in diameter; lobes 4, ovate, rounded, 2 mm. long. Petals 4, free, about 4 mm. long, elliptic to elliptic-obovate. Stamens very numerous.

SARAWAK, Kuching, *Haviland 2928*, March 14, 1893.

In aspect this species somewhat resembles *Eugenia polyccephala*, Miq., but is not closely allied to that species, differing radically in its vegetative characters and in its short, fascicled, few-flowered inflorescences.

***Eugenia subsessilifolia*, sp. nov. § *Jambosa*.**

Arbor glabra, ramis ramulisque laevibus, teretibus, subcastaneis; *foliis* oppositis, coriaceis, oblongis, epunctatis, usque ad 13 cm. longis, apice perspicue sed obtuse acuminatis, basi late rotundatis, distincte cordatis, subamplexicaulibus, sessilibus vel subsessilibus, supra in siccitate obscure olivaceis, subtus rubro-brunneis; nervis primariis utrinque circiter 12, subtus distinctis, anastomosantibus; *inflorescentiis* cymosis, axillaribus terminalibusque, brevibus, circiter 2.5 cm. longis, axillaribus paucifloris, terminalibus densifloris; *floribus* circiter 1.8 cm. longis, 4-meris; *calycis* tubo deorsum gradatim angustato.

A glabrous tree, the branches and branchlets smooth, subcastaneous, somewhat shining, terete, the nodes somewhat thickened. Leaves oblong, coriaceous, not punctate, the upper surface dark-olivaceous somewhat shining, the lower reddish-brown when dry, sessile or subsessile, 10 to 13 cm. long, 4 to 5 cm. wide, apex rather prominently but bluntly acuminate,

base broadly rounded and distinctly cordate, subamplexicaul; midrib impressed on the upper surface, prominent beneath; lateral nerves about 12 on each side of the midrib, somewhat curved, slender, distinct, slightly projecting on the lower surface, anastomosing with the subequally distinct and slightly arched marginal nerves about 5 mm. from the edge of the leaf. Inflorescences short, cymose, axillary and terminal, the rachis of the lateral inflorescences solitary, less than 1 cm. long, usually 2- or 3-flowered, the terminal inflorescences about 2.5 cm. long, including the flowers, dense, the whole inflorescence about 4 cm. in diameter, the branches about 1 cm. long, each usually 3-flowered. Flowers about 1.8 cm. long and nearly as wide in anthesis, when dry dark-brown. Calyx-tube at least 1 cm. long, gradually narrowed below forming a pseudostalk, sessile, in bud clavate. Sepals orbicular-reniform, about 4 mm. wide. Petals ovate, about 5 mm. long. Filaments numerous, up to 8 mm. in length.

SARAWAK, near Kuching, *Haviland* 2923, February 6, 1893 "petals and sepals caducous."

The alliance of this species is apparently with the Javan *Eugenia hypericifolia*, (Blume) Koord. & Val., from which it is distinguished not only by the shape and apparently less distinct venation of its leaves, but also by its many-flowered inflorescences and clavate eglandular buds.

***Eugenia lunduensis*, sp. nov. § *Jambosa*.**

Arbor glabra, ramis ramulisque teretibus vel ramulis leviter compressis vel sulcatis: *foliis* sessilibus vel brevissime petiolatis, chartaceis, oblongo-ellipticis, usque ad 20 cm. longis, acuminatis, basi rotundatis, leviter cordatis, epunctatis, supra olivaceo-brunneis, laevibus, nitidis, subtus pallidis; nervis utrinque circiter 15, subtus valde prominulis, leviter curvatis, cum nervis marginalibus valde distinctis anastomosantibus; inflorescentiis terminalibus, brevissimis, depauperato-cymosis, paucifloris: *floribus* confertis: *calyce* circiter 1 cm. longo, deorsum angustato, lobis patulis; *petalis* suborbicularibus, liberis.

A glabrous tree, the branches and branchlets terete, smooth, pale-brownish, or the ultimate branchlets somewhat compressed or sulcate, never angled, about 3 mm. in diameter. Leaves opposite, chartaceous, oblong-elliptic, sessile or subsessile, 18 to 20 cm. long, 7 to 9 cm. wide, punctate, subequally narrowed upward to the acuminate apex and below to the rounded and somewhat cordate base, the upper surface olivaceous-brownish, smooth, somewhat shining, the nerves usually slightly impressed, the lower surface pale, shining; lateral nerves about 15 on each side of the midrib, very prominent, slightly curved, anastomosing with the equally distinct, nearly straight

or slightly arcuate marginal nerves about 5 mm. from the edge of the leaf. Cymes depauperate, terminal, the axis and very short branches 5 mm. long or less, the base with several pairs of lanceolate, acuminate, stiff, 5 mm. long bracts, the bracteoles subtending the flowers oblong-ovate, 1.5 mm. long; the pedicels about 2 mm. long. Calyx-tube about 1 cm. long, the limb somewhat spreading, and 8 to 9 mm. in diameter, excluding the lobes, narrowed below, somewhat funnel-shaped; lobes ovate, rounded, sparsely punctate, 4 to 5 mm. long. Petals 4, free, orbicular, about 6 mm. long. Filaments about 6 mm. long (from unopened buds). Styles about 1.5 cm. long.

SARAWAK, Lundu, Mount Gadug, *Haviland* 985, 1892.

The alliance of this species is manifestly with *Eugenia pseudo-formosa*, King, from which it differs chiefly in its somewhat smaller, fewer-nerved leaves and in its distinctly smaller flowers. Another allied species is *Eugenia sexangulata*, (Miq.) Koord. & Val., which differs from the present species, among other characters in its angular branchlets.

***Eugenia rhynchophylla*, sp. nov. § *Sysygium*.**

Arbor glabra, ramis ramulisque tenuibus, teretibus, pallidis; *foliis* chartaceis vel subcoriaceis, oblongis vel oblongo-ellipticis, usque ad 10 cm. longis, perspicue subcaudato-vel rostrato-acuminatis, basi acutis vel leviter acuminatis, in siccitate olivaceis vel brunneo-olivaceis, nitidis, supra minute impresso-puncticulatis, subtus sub lente perspicue punctatis, nervis primariis utrinque circiter 10, irregularibus, distantibus, patulis, leviter curvatis, anastomosantibus, reticulis obsoletis vel subobsoletis; *inflorescentiis* depauperato-cymosis, paucifloris, solitariis vel fasciculatis, axillaribus et terminalibus, usque ad 5 mm. longis; *floribus* obovoideis, circiter 3 mm. longis, sessilibus vel subsessilibus; *petalis* connatis, calyptratim deciduis.

A glabrous tree with slender, terete, pale, smooth branches and branchlets 1.5 to 2 mm. in diameter. Leaves opposite, chartaceous or subcoriaceous, brittle, olivaceous to brownish-olivaceous on both surfaces and somewhat shining when dry, oblong to oblong-elliptic, 8 to 10 cm. long, 3 to 4 cm. wide, the apex conspicuously subcaudate- or rostrate-acuminate, the acumen blunt, about 1 cm. long, the base acute to somewhat acuminate, the upper surface minutely impressed-puncticulate, the lower distinctly punctate under a lens; lateral nerves about 10 on each side of the midrib, spreading, slightly curved, prominent and projecting on the lower surface, usually impressed on the upper surface, distant, rather irregular, anastomosing with the equally distinct marginal nerves 2 to 4 mm. from the edge of the leaf, the lateral nerves somewhat arched between the anastomoses, the reticulations obsolete or subob-

solete: petioles 5 to 8 mm. long. Cymes depauperate, few-flowered, axillary and terminal, solitary or few in a fascicle, 5 mm. long or less, the rachis short, usually with two short lateral branchlets, each bearing one flower. Flowers obovoid, about 3 mm. long, sessile or subsessile, the limb very slightly produced, truncate. Petals wholly united into a deciduous calyptra about 1.5 mm. in diameter. Stamens numerous, their filaments very short.

SARAWAK, Kuching, *Haviland* 2930. May 19, 1893.

This species is especially well characterized by its slender, terete, pale branches and branchlets, the internodes 3 to 9 cm. in length, and its very short, few-flowered, depauperate, axillary and terminal cymes, which do not exceed the petioles in length. It differs radically from *Eugenia baramensis*, Merr., another Bornean species that has very short, few-flowered cymes not only in its vegetative characters but also in its pale, terete, not 4-angled branches and branchlets.

Schefflera, Forster.

Six species of this genus were definitely known from Borneo, and an examination of the material in the Singapore herbarium has enabled me to increase the list to ten. Of the previously described species I was able to match but two in the Singapore herbarium, these being *Schefflera tetrandra*, Merr., represented by *Ridley* 12251 from Matang, and *Haviland* s.n. from Kuching, and *S. borneensis*, Merr., represented by a Kuching specimen probably collected by *Haviland*. There are four additional species in the Singapore herbarium, and five in the Bureau of Science herbarium, making a total of nineteen Bornean species; however, as the material representing these additional nine species is decidedly inadequate in each case, I do not consider it advisable to attempt to carry the classification beyond the genus at the present time.

Schefflera borneensis, sp. nov.

Arbor parva, inflorescentiis perspicue brunneo-furfuraceis; foliis longe petiolatis, 8- vel 10-foliolatis, foliolis oblongis, integris, coriaceis, usque ad 26 cm. longis, breviter acuminatis, basi obtusis vel acutis, nervis tuncque circiter 12, utrinque cum reticulis distinctis: inflorescentiis ut videtur terminalibus, ramis primariis numerosis, confertis, racemose dispositis, usque ad 20 cm. longis: umbellis numerosis, tenuiter pedunculatis, 15—20-floris: floribus parvis, 5-meris: petalis extus parvis et minutissime furfuraceis, ovatis, circiter 2 mm. longis: fructibus circiter 4 mm. longis, subellipsoideis, acute 5-angulatis, sulcatis.

A small tree, glabrous except the conspicuously brown-furfuraceous inflorescences. Branches apparently thickened.

Leaves palmately 8- to 10-foliolate, their petioles up to 43 cm. long; leaflets coriaceous, pale or pale-brownish when dry, somewhat shining, oblong, 18 to 26 cm. long, 6 to 8 cm. wide, apex shortly acuminate, base obtuse to acute; primary lateral nerves about 12 on each side of the midrib, rather distinct although but slightly projecting on both surfaces as are the rather close reticulations, curved, anastomosing; petiolules 3.5 to 8 cm. long, somewhat thickened at their apices. Inflorescence apparently terminal, consisting of numerous, elongated, racemously arranged, crowded primary branches about 40 cm. in length, each subtended by a coriaceous, lanceolate to ovate-lanceolate, acuminate, 3 cm. long, furfuraceous bract. Umbels numerous, 15- to 20-flowered, their peduncles slender, in anthesis 1.5 to 2 cm. long, each subtended by an oblong, about 5 mm. long, deciduous, bract, the pedicels up to 4 mm. in length, all parts brown-furfuraceous. Flowers 5-merous; the calyx funnel-shaped, about 1.8 mm. in diameter, 5-toothed, the teeth lanceolate-acuminate from a broad base, about 0.5 mm. long. Petals ovate, 2 mm. long, externally minutely and sparingly furfuraceous. Fruits ellipsoid, about 4 mm. long, prominently and sharply 5-angled, 5-sulcate.

SARAWAK, Kuching, *Haviland 2948* (type), January 25, 1893, "small tree, flowers yellow; *Native collector 1060 Bur. Sci.*

This species is strongly characterized by its numerous, coriaceous, entire leaflets, the petioles being unusually long, and its numerous, crowded, greatly elongated primary branches of the inflorescences which are conspicuously brown-furfuraceous throughout and about 40 cm. in length. Haviland's specimen presents ten of these primary branches, manifestly but a part of those from a single inflorescence.

***Schefflera burkillii*, sp. nov.**

Frutex glaber; *foliis* 5—3-foliolatis, foliolis coriaceis, olivaceis, oblongis ad oblongo-ellipticis, integris, usque ad 10 cm. longis, acutis vel leviter acuminatis, basi acutis, nervis utrinque circiter 10, tenuibus, reticulis distinctis; *inflorescentiis* terminalibus, brevissime pedunculatis, circiter 5 cm. longis, ramis primariis usque ad 4, subumbellatim dispositis; *umbellis* in ramis singulis usque ad 7, pedunculatis, 10—15-floris; *floribus* pedicellatis, 6-meris, petalis circiter 2.8 mm. longis.

A glabrous shrub, the branches rugose when dry, about 5 mm. in diameter, dark-colored. Leaves 5- to 3-foliolate, their petioles about 4 cm. long, inflated at the base, the narrow margins of the inflated part somewhat recurved, not appressed to the branches. Leaflets coriaceous, olivaceous when dry, oblong to oblong-elliptic, 8 to 10 cm. long, 3.5 to 4 cm. wide, entire, base acute, apex acute to somewhat acuminate, mar-

gins entire; lateral nerves about 10 on each side of the midrib, slender, nearly straight, anastomosing, the reticulations rather close and distinct; petiolules 1 to 1.5 cm. long. Inflorescences very shortly peduncled, terminal, about 5 cm. long, the primary branches up to 4, subumbellately disposed near the apex of the peduncle, each bearing up to 7 umbels, in some the umbels mostly near the tips of the branchlets, in others racemously disposed. Umbels 10- to 15-flowered, their peduncles 8 to 12 mm. long. Flowers 6-merous, their pedicels 2 to 4 mm. long. Calyx somewhat funnel-shaped, truncate, 2.4 mm. in diameter. Petals oblong, acute, about 2.8 mm. long. Anthers 6.

SARAWAK. Matang road, *Native collector 892 Bur. Sci.* (type), August 11, 1911; Matang, June 14, 1893, from the Sarawak Museum, apparently collected by *Haviland*.

Among the Bornean species this is apparently most closely allied to *Schefflera polita*, (Miq.) Viguier, but differs in numerous characters, notably in its entirely different stipules, which in this species are reduced to a recurved narrow rim distant from the branchlet.

***Schefflera havilandii*, sp. nov.**

Frutex vel arbor parva, glabra; *foliis* longissime petiolatis, foliolis 7—9, oblongis, coriaceis, in siccitate brunneo-olivaceis, nitidis, laevibus, usque ad 18 cm. longis, integris, abrupte et breviter acuminatis, basi acutis vel rotundatis, nervis utrinque circiter 7, tenuibus, curvatis vel adscendentibus, saepe indistinctis, reticulis obsoletis; *inflorescentiis* ut videtur terminalibus, ramis primariis (numerosis?) valde elongatis, usque ad 45 cm. longis; *umbellis* numerosis, in ramis primariis racemose dispositis, pedunculatis, circiter 8-floris; *fructibus* junioribus obovoideis, truncatis, circiter 3 mm. longis, deorsum angustatis, basi acutis, irregulariter rugosis, 6-locellatis.

A shrub or a small tree, glabrous. Leaves palmately 7- to 9-foliate, their petioles at least 30 cm. long; leaflets coriaceous, oblong, entire, brownish-olivaceous, shining, smooth. the apex rather abruptly and shortly acuminate, base acute to rounded, 16 to 18 cm. long, 5 to 7 cm. wide; primary nerves about 7 on each side of the midrib, slender, often indistinct, ascending or curved, the reticulations obsolete; petiolules 3 to 6 cm. long. Inflorescences apparently terminal and composed of several (many?) greatly elongated primary branches, these up to 45 cm. in length, the lower parts naked, the upper two-thirds to three-fourths of each with numerous, racemously disposed, about 8-flowered umbels, their peduncles 1 to 1.5 cm. in length. Pedicels about 5 mm. long. Young fruits obovoid, truncate, narrowed below to the acute base, irregularly rugose, about 3 mm. long, 6-celled.

SARAWAK, near Kuching, *Haviland's collector* 192, November 23, 1892; *Haviland* 2947, March 22, 1893.

At first glance this species resembles *Schefflera borneensis*, Merr., but is readily distinguished by its smooth leaflets in which the reticulations are obsolete, and its glabrous inflorescences. It probably has the same type of inflorescence as the latter, but the specimens available do not show its true characters, the primary branches being detached.

***Schefflera racemosa*, sp. nov.**

Frutex, inflorescentiis floribusque cinereo-puberulis; *foliis* longissime petiolatis, 6-foliolatis, foliolis in siccitate pallidis, subcoriaceis, oblongis, usque ad 25 cm. longis, acuminatis, basi obtusis, margine perspicue distanter serratis vel subintegris, nervis utrinque circiter 6, subtus valde prominulis, curvatis, arcuato-anastomosantibus, reticulis laxissimis; *inflorescentiis* breviter pedunculatis, ramis circiter 3, circiter 25 cm. longis; *floribus* in fasciculis distantibus dispositis, breviter pedicellatis, plerumque 8-meris; *petalis* oblongo-ovatis, circiter 3 mm. longis, extus puberulis.

A shrub, glabrous except the cinereous-puberulent inflorescences and flowers, the branches up to 1 cm. in diameter. Leaves 6-foliolatis, their petioles 35 to 40 cm. in length, the petiolules 2 to 8 cm. long, the exterior ones shorter than the central ones; leaflets pale when dry, subcoriaceous, oblong, 18 to 25 cm. long, 5 to 10 cm. wide, narrowed below to the obtuse base and above to the rather slenderly acuminate apex, the margins distantly and rather prominently serrate to subentire; lateral nerves about 6 on each side of the midrib, distant, lax, curved, arcuate-anastomosing, very prominent on the lower surface, the reticulations very lax. Inflorescences apparently in the uppermost axils, usually 3-branched, shortly peduncled, the peduncles 3 cm. long or less, the branches usually about 25 cm. long. Flowers in distant fascicles on the primary branches, usually six or less in a fascicle, each fascicle subtended by an ovate-lanceolate, acuminate, puberulent, deciduous bract 5 mm. long or less; the pedicels puberulent, 2 mm. long or less. Calyx funnel-shaped, truncate or obscurely denticulate, about 3 mm. in diameter and 2 mm. long, puberulent. Petals 7 to 9, usually 8, oblong-ovate, acute, about 3 mm. long, externally puberulent. Stamens as many as the petals. Fruits unknown.

SARAWAK, Bau, *Ridley* 11775 (type), July, 1893, *Anderson* 49, August, 1912; Braang, *Haviland* 35, November, 1888; Mount Sudan, *Native collector* 2042 *Bur. Sci.*

This species is well characterized by its long-petioled leaves, prominently nerved leaflets, and by its characteristic

inflorescences, the primary branches usually three in number, cinereous-puberulent, and the shortly pedicelled, usually 8-merous flowers being arranged in distant, few-flowered fascicles, not in umbels.

***Saurauia*, Willdenow.**

Saurauia planchonii, Hook. f. in Trans. Linn. Soc. **23** (1860) 161.

SARAWAK, near Tegora, *Haviland* 2048 and a sheet without number indicated as “= 2048”; Kuching, *Haviland*, indicated as “= 764” (inflorescences immature); Matang, *Ridley*; Bau, *Ridley* 11785, “epiphyte, flowers red”; Tambusan, *Ridley*.

A characteristic endemic species.

Saurauia heterosepala, Merr. in Philip. Journ. Sci. **13** (1918) Bot.

SARAWAK, near Kuching, *Haviland* 27 and *s.n.*, March, 1893. The specimens differ in a few minor details from the type but I think represent this species.

Saurauia oblancifolia, Merr. nom. nov.

Saurauia oblanceolata, Merr. in Philip. Journ. Sci. **13** (1918) Bot. 92, non Ridley, 1916.

SARAWAK, Bongaya, *Ridley* 9076, December, 1897, “shrub, flowers white, said to be irritating.” The specimen agrees closely with the type.

Saurauia ferox, Korth., Verh. Nat. Gesch. Bot. (1839-42) 132, t. 30.

SARAWAK, *Haviland s.n.* Apparently typical of this endemic species.

Saurauia amoena, Stapf in Trans. Linn. Soc. Bot. **4** (1894) 134.

BRITISH NORTH BORNEO, Mount Kinabalu, *Haviland* 1361, a cotype of this endemic species.

In addition to the above and those described below, there is in the herbarium also a species indicated under an as yet unpublished name proposed by Stapf, represented by four specimens, and an apparently undescribed species represented by a rather inadequate specimen from Gaya, collector not indicated but probably Ridley.

Saurauia glabra, sp. nov.

Frutex glaber; *foliis* coriaceis, in siccitate olivaceis, nitidis, subtus brunneis vel castaneis, plerumque oblongis, usque

ad 18 cm. longis, breviter acuminatis, basi acutis, margine crenulatis, nervis utrinque 8—10, distinctis; *floribus* e ramis defoliatis, solitariis vel binis, glabris, longe pedicellatis; *sepalis* valde inaequalibus, exterioribus ellipticis, circiter 6 mm. longis, interioribus latissime ovatis vel suborbicularibus, circiter 8 mm. longis; *ovario* glabro; stylis 3, circiter 9 mm. longis, basi leviter connatis.

A shrub, glabrous throughout, or the very youngest parts slightly furfuraceous, soon becoming entirely glabrous. Leaves mostly oblong, coriaceous, 10 to 18 cm. long, 4 to 7 cm. wide, usually olivaceous when dry, the lower surfaces brownish to castaneous, shining, the apex shortly and rather obtusely acuminate, base acute, margins crenulate; lateral nerves 8 to 10 on each side of the midrib, prominent; petioles 2 to 3 cm. long. Flowers on the branches below the leaves, solitary or in pairs, their pedicels ultimately 3 cm. in length (in young fruit) in bud shorter, each with one or two ovate, obtuse bracts in the lower part 1 mm. long or less. Sepals glabrous, unequal, the outer two elliptic, about 6 mm. long and 3.3 mm. wide, the inner three broadly ovate to suborbicular, about 8 mm. long. Corolla about 12 mm. long, the lobes 9 by 6 mm., the apex truncate-rounded and retuse. Stamens about 30. Ovary glabrous; styles 3, glabrous, about 9 mm. long, united for the lower 1 to 2 mm.

SARAWAK, Matang, *Hariland s.n.*, August, 1888 (type), Penkuku, *Hariland s.n.*; near Kuching, *Hariland 1004*, January 19, 1892 (with some of the leaves obovate), *Native collector 256, 555, 2495 Bur. Sci.*

This species greatly resembles *Saurauia nudiflora*, DC., of the Malay Peninsula, Sumatra, and Java, but is at once distinguished from it by its 3, not 5 styles; it differs also in various other characters.

Saurauia spinuloso-setosa, sp. nov.

Frutex vel arbor parva, ramis et foliis utrinque et inflorescentiis perspicue curvato-spinuloso-setosis, setis plerumque subpatulis, ferrugineis vel subferrugineis; *foliis* chartaceis, ellipticis vel ovato-ellipticis, usque ad 17 cm. longis, in siccitate supra castaneis, subtus pallidioribus, apice tenuiter caudato-acuminatis, basi saepe leviter inaequilateralibus, obtusis vel rotundatis, margine perspicue spinulosis, nervis utrinque circiter 15, perspicuis; *cymis* axillaribus, solitariis vel fasciculatis, subsessilibus vel breviter pedunculatis, paucifloris; *bracteis* linearibus, 4 ad 6 mm. longis, setosis; *sepalis* setosis, oblongo-ovatis, acutis, circiter 5.5 mm. longis; *antheris* circiter 30; *ovario* glabro, stylis 3, liberis, glabris, 3 mm. longis.

A shrub or small tree, all parts prominently spinulose-setose with brownish to ferrugineous, usually spreading, curved

setae 2 to 5 mm. in length. Leaves chartaceous, elliptic to ovate-elliptic, 11 to 17 cm. long, 5.5 to 8 cm. wide, the apex slenderly caudate-acuminate, the acumen usually about 2 cm. in length, the base often somewhat inequilateral, obtuse to rounded, the margins prominently spinulose-setose, the upper surface castaneous, with numerous, scattered, curved, rather short setae, the lower surface pale-brownish, densely setose on the midrib and nerves, with fewer and smaller setae on the reticulations; lateral nerves about 15 on each side of the midrib, prominent, curved; petioles 1 to 2 cm. long, densely setose. Cymes axillary, solitary or fascicled, few-flowered, 2 cm. long or less, all parts prominently setose, the peduncles 8 mm. long or less, the pedicels slender, 6 to 10 mm. long; bracts linear, 4 to 6 mm. long, densely setose. Sepals about 5.5 mm. long, setose, oblong-ovate, acute. Corolla-lobes oblong, about 6 mm. long, 2.5 mm. wide, apex truncate-rounded, not or but obscurely retuse. Stamens about 30. Ovary glabrous; styles 3, free, glabrous, 3 mm. long.

SARAWAK, Kalaka, April 17, 1895, collector not indicated, but probably *Haviland*.

This species is prominently characterized by its numerous, slender, usually spreading, curved setae which are present on all the vegetative parts; its slenderly caudate-acuminate, prominently spinulose leaves which are castaneous above when dry and pale-brown beneath; and its few-flowered, axillary cymes. It is probably as closely allied to *Saurauia acuminata*, Merr., as to any other described form but is radically different from that species.

***Saurauia ridleyi*, sp. nov.**

Frutex vel arbor parva, ramis teretibus, glabris, ramulis junioribus densissime longe subadpresse setosis; *foliis* chartaceis, oblongis, oblongo-obovatis, vel oblongo-oblancoelatis, plerumque utrinque subaequaliter angustatis, apice tenuiter acuminatis, basi acutis vel obtusis, usque ad 37 cm. longis, margine spinulosis, supra glabris, subtus ad costam nervosque spinulosis, nervis utrinque 15 ad 20, perspicuis; *floribus* fasciculatis, axillaribus vel e ramis vetustioribus, pedicellis ciliato-hirsutis; *sepalis* extus parce hirsutis, circiter 4 mm. longis; *petalis* oblongis, obtusis; *ovario* glabro; *stylis* 3, tomentosis, circiter 3 mm. longis, in $\frac{1}{3}$ inferiore parte connatis.

A shrub or a small tree, the tips of the branchlets and the younger petioles densely subappressed-setose with slender, brownish to fulvous setae up to 5 mm. in length, the branches terete, glabrous. Leaves chartaceous, oblong, oblong-obovate, or broadly oblong-oblancoelate, for the most part subequally narrowed to base and apex, 15 to 37 cm. long, 7 to 11 cm. wide, the apex slenderly acuminate, the base acute to somewhat

obtuse, the upper surface entirely glabrous, pale-olivaceous, shining, the lower rather prominently curved-setose on the midrib and lateral nerves and otherwise somewhat hirsute, the margins spinulose, the slender teeth appressed or incurved; lateral nerves 15 to 20 on each side of the midrib, prominent, curved, the reticulations distinct, subparallel; petioles 1.5 to 4 cm. long, when young rather densely curved-setose like the branchlets, in age glabrous or nearly so. Flowers fascicled, axillary and on the older branches below the leaves, few to as many as 15 in a fascicle, the slender pedicels up to 12 mm. in length, ferruginous-hirsute. Sepals elliptic-oblong to ovate, acute, about 4 mm. long, externally slightly hirsute. Corolla-lobes oblong, obtuse or rounded, equilateral, about 4 mm. long and 2 mm. wide. Stamens about 20, the anthers 2.5 to 3 mm. long. Ovary glabrous. Styles 3, tomentose, about 3 mm. long, united for the lower 1 mm.

SARAWAK, Lundu, *Ridley 12459* (type), September, (1894 ?) Matang, *Hullett, s.n.*, *Ridley 12269*, August, 1893.

This species is well characterized by its rather densely incurved-setose branchlets and petioles, the midrib and lateral nerves on the lower surface of the leaves with similar setae, and its fascicled, slenderly pedicelled flowers with glabrous ovaries and tomentose styles.

Saurauia havilandii, sp. nov.

Frutex vel arbor parva, partibus junioribus inflorescentiisque exceptis glaber vel subglaber; ramis teretibus, glabris, ramulis parce adpresse squamosis; *foliis* chartaceis, oblongis vel oblongo-ovatis, usque ad 25 cm. longis, tenuiter acute acuminatis, basi acutis, margine breviter subadpresse serratis, supra glabris, subtus pallidis, glabris, vel ad costa parcellissime adpresse squamosis, nervis utrinque 15—18, perspicuis; petiolo 3 ad 4 cm. longo; *paniculis* terminalibus vel ex axillis superioribus, pedunculatis, solitariis, pedunculatis, multifloris, usque ad 20 cm. longis, dense adpresse squamoso-setosis, squamis vel setis brevibus; *floribus* parvis; *sepalis* 2.5 ad 3 mm. longis, exterioribus extus adpresse setosis; *antheris* 10; *ovario* glabro; *stylis* 3, distincte tomentosis, ad basi leviter connatis, 2 mm. longis.

A shrub or small tree, glabrous or nearly so except the very young parts and the inflorescences. Branches terete, dark reddish-brown, glabrous, the branchlets with few, closely appressed, short, thick scales. Leaves chartaceous, oblong to oblong-ovate, 14 to 25 cm. long, 6 to 10 cm. wide, narrowed upward to the slenderly and acutely acuminate apex, the acumens sometimes subcaudate and up to 2.5 cm. long, the base acute to subobtuse or broadened as to be almost rounded, the margins with small, closely appressed, short, thickened, sharp

teeth, the upper surface blackish when dry, glabrous, the lower pale, glabrous, or the midrib with very few appressed scales; lateral nerves 15 to 18 on each side of the midrib, prominent, curved, anastomosing, the reticulations subparallel, distinct; petioles 3 to 4 cm. long, glabrous or nearly so. Panicles solitary, terminal or in the uppermost axils, peduncled, up to 20 cm. long, many-flowered, the peduncles 4 to 6 cm. long, with few, appressed scales, the lower branches up to 7 cm. in length, these with the branchlets and the rachis rather densely appressed setose-scaly, the setae or scales brownish, short. Flowers numerous, small, their pedicels 2 to 3 mm. long, the bracts linear-lanceolate, 2 mm. long or less, appressed-setose. Sepals thin, elliptic-ovate, acute to obtuse, externally sparingly appressed-setose, 2.5 to 3 mm. long. Corolla-lobes elliptic, rounded, 3.5 to 4 mm. long, not retuse. Anthers 10, about 2 mm. long. Ovary globose, glabrous; styles 3, distinctly tomentose, about 2 mm. long, slightly united below.

SARAWAK, Braang, *Haviland s.n.*, November, 1888.

In general appearance this species resembles *Saurauia planchonii*, Hook. f., and is manifestly allied to it. It can be readily distinguished by its leaves being entirely glabrous beneath or at most with but few, closely appressed scales on the midrib.